

CLAIMS

1. An electronic apparatus comprising:

a controller including an interface part which communicates with an external host apparatus, and a status register group; and

5 a plurality of functional units communicating with the host apparatus via the interface part, respectively,

wherein the status register group includes a plurality of operable status registers which correspond to the functional units, respectively, and which indicate whether the corresponding functional units are
10 operable (hereinafter referred to as "an operable state") or not (hereinafter referred to as "an inoperable state"), and a plurality of processing status registers which correspond to the functional units, respectively, and which indicate whether the corresponding functional units are executing processings (hereinafter referred to as "a
15 Function-Being-Processed State") or not (hereinafter referred to as "a Function-Unprocessed State"), and

wherein the controller transfers a command to the functional unit when the controller receives the command from the host apparatus and the command is a command for any one of the functional units,
20 and transmits a status of the status register group to the host apparatus as a response to the read command when the command is a read command for the status register group.

2. The electronic apparatus as claimed in Claim 1,

wherein all the operable status registers of the status register
25 group and all the processing status registers of the status register group

are set to the inoperable state and the Function-Unprocessed State, respectively, when the controller is activated.

3. The electronic apparatus as claimed in Claim 1,

wherein the interface part performs a master-slave system type
5 data communication with the host apparatus, in which the host
apparatus serves as a master, and the electronic apparatus serves as a
slave, and

wherein the functional unit starts activating upon receiving an
activation command from the host apparatus; the operable status
10 register corresponding to the functional unit turns from the inoperable
state to the operable state when the functional unit turns into the
operable state; and the functional unit stops operation thereof and
turns into the inoperable state, and the operable status register
corresponding to the functional unit turns from the operable state to
15 the inoperable state upon receiving a stop command for the functional
unit from the host apparatus.

4. The electronic apparatus as claimed in Claim 1,

wherein the status register group further includes a plurality of
activation command registers corresponding to the functional units,
20 respectively, the activation command registers for activating the
corresponding functional units,

wherein all the activation command registers of the status
register group are set to be stopped when the controller is activated,
and

25 wherein the host apparatus starts activation of the functional

unit by setting one of the activation command registers corresponding to one of the functional units that is to be activated, to be activated, and stops the functional unit by setting the activation command register to be stopped.

5 5. The electronic apparatus as claimed in Claim 1,
 wherein the interface part performs a master-slave system type data communication with the host apparatus, in which the host apparatus serves as a master, and the electronic apparatus serves as a slave,

10 wherein the processing status register corresponding to the functional unit turns from the Function-Unprocessed State to the Function-Being-Processed State when the functional unit is in the Function-Being-Processed State, and

 wherein the processing status register corresponding to the
15 functional unit turns from the Function-Being-Processed State to the Function-Unprocessed State when the functional unit finishes the function processing or when the functional unit is suspended in response to a command from the host apparatus.

 6. The electronic apparatus as claimed in Claim 5,
20 wherein the host apparatus and the interface parts are connected to each other via a line including a command signal line and a data line,

 wherein the command from the host apparatus to the electronic apparatus, the response from the electronic apparatus to the host
25 apparatus, and data including data showing the status information on

the status register group, are transmitted via the command signal line,
and

wherein predetermined data that is to be transmitted from the
host apparatus to the electronic apparatus, predetermined data that is
5 to be transmitted from the electronic apparatus to the host apparatus,
and a busy signal that indicates that the functional unit is in the
Function-Being-Processed State and in busy state, are transmitted via
the data line.

7. The electronic apparatus as claimed in Claim 6,
10 wherein the status register group further includes a plurality of
bus release registers each of which releases a busy state of the data line
so that the host apparatus transmits and receives data to and from one
of the functional units other than the functional unit that is executing
processings when the functional unit that is in the
15 Function-Being-Processed State outputs the busy signal to the data
line,

wherein the controller rewrites the bus release register upon
receiving a rewrite command for the bus release register from the host
apparatus, and

20 wherein the interface part makes the host apparatus possible to
transmit and receive the data to and from the functional unit other than
the functional unit that is executing processings by stopping outputting
the busy signal to the data line.

8. The electronic apparatus as claimed in Claim 6,
25 wherein the functional unit that is in the

Function-Being-Processed State acquires a bus use right when data transmission and reception between the host apparatus and the functional units is finished or when operation of the functional units is stopped, and the functional units selected by the host apparatus
5 acquires the bus use right when the processing status registers corresponding to the plurality of functional units are in the Function-Being-Processed State, in the case that the host apparatus activates a plurality of functional units.

9. The electronic apparatus as claimed in Claim 1,
10 wherein the electronic apparatus is a multifunctional IC card.

10. A method of controlling the electronic apparatus, the electronic apparatus comprising a plurality of functional units and a state register group including a plurality of operable status registers which correspond to the functional units, respectively, and which
15 indicate whether the corresponding functional units are in an operable state or in an inoperable state, and a plurality of processing status registers which correspond to the functional units, respectively, and which indicate whether the corresponding functional units are in a Function-Being-Processed State or a Function-Unprocessed State, the
20 method including:

a first rewrite step of rewriting the operable status registers according to whether or not the corresponding functional units are in the operable state;

a second rewrite step of rewriting the processing status registers
25 according to whether or not the corresponding functional units are in

the Function-Being-Processed State;

a first command reception step of transferring a command to the functional unit upon receiving the command for the functional units from an external host apparatus; and

5 a second command reception step of transmitting a status of the status register group to the host apparatus as a response to a read command upon receiving the read command for the status register group from the host apparatus.

11. The method of controlling the electronic apparatus as
10 claimed in Claim 10,

wherein the first rewrite step includes setting all of the operable status registers of the status register group into an inoperable state when the controller is activated, and

wherein the second rewrite step includes setting all of the
15 processing status registers of the status register group into a Function-Unprocessed State when the controller is activated.

12. The method of controlling the electronic apparatus as
claimed in Claim 10,

wherein the method is a control method of the electronic
20 apparatus for performing a master-slave system type data communication with the host apparatus, in which the host apparatus serves as a master, and the electronic apparatus serves as a slave,

wherein the first rewrite step includes starting activation of the functional unit upon receiving an activation command for the functional
25 units from the host apparatus, rewriting the operable status register

which corresponds to the functional unit from the inoperable state to the operable state when the functional unit turns into the operable state, and stopping operation of the functional unit to make the functional unit in the inoperable state and rewriting the operable status register corresponding to the functional unit from the operable state to the inoperable state upon receiving a stop command for the functional unit from the host apparatus.

13. The method of controlling the electronic apparatus as claimed in Claim 10,

10 wherein the status register group further includes a plurality of activation command registers corresponding to the functional units, respectively, the activation command registers for activating the corresponding functional units,

wherein the method including steps of:

15 setting all the activation command registers of the status register group not to be activated when the controller is activated;

rewriting an activation command register corresponding to the functional unit to activate upon receiving an activation command for one of the functional units from the host apparatus;

20 activating the functional unit;

rewriting the activation command register corresponding to the functional unit not to be activated upon receiving a stop command for the functional unit from the host apparatus; and

stopping the functional unit.

25 14. The method of controlling the electronic apparatus as

claimed in Claim 10,

wherein the method is a control method of the electronic apparatus for performing a master-slave system type data communication with the host apparatus, in which the host apparatus serves as a master, and the electronic apparatus serves as a slave, and

5 wherein, at the second rewrite step, the processing status register corresponding to the functional unit turns from the Function-Unprocessed State to the Function-Being-Processed State when the functional unit is in the Function-Being-Processed State; and
10 the processing status register turns from the Function-Being-Processed State to the Function-Unprocessed State when the functional unit finishes processing or when the functional unit is suspended in response to a command from the host apparatus.

15 15. The method of controlling the electronic apparatus as claimed in Claim 14,

wherein the host apparatus and the electronic apparatus are connected to each other to via a line including a command signal line and a data line, and

wherein the method including steps of:

20 transmitting the command from the host apparatus to the electronic apparatus, the response from the electronic apparatus to the host apparatus, and data including data showing the status information on the status register group via the command signal line; and

transmitting predetermined data transmitted from the host
25 apparatus to the electronic apparatus; predetermined data transmitted

from the electronic apparatus to the host apparatus, and a busy signal via the data line.

16. The method of controlling the electronic apparatus as claimed in Claim 15,

5 wherein the status register group further includes a plurality of bus release registers corresponding to the functional units, respectively, and each of which releases a busy state of the data line so that the host apparatus transmits and receives data to and from one of the functional units other than the functional unit that is executing processings when
10 the functional unit that is in the Function-Being-Processed State outputs the busy signal to the data line, and

 wherein the method including steps of:

 rewriting the bus release registers upon receiving a rewrite command for the bus release register from the host apparatus; and

15 stopping outputting the busy signal to the data line, and transmitting and receiving the data between the host apparatus and the functional unit other than the functional unit that is executing processings.

17. The method of controlling the electronic apparatus as
20 claimed in Claim 15, including a step of:

 allowing the functional unit in the Function-Being-Processed State to acquire a bus use right when data transmission and reception between the host apparatus and the functional units is finished or when operation of the functional units is stopped, and allowing the
25 functional units selected by the host apparatus to acquire the bus use

right when the processing status registers corresponding to the plurality of activated functional units are in the Function-Being-Processed State, in the case that the host apparatus activates a plurality of functional units.